STATUS OF CLAIMS

1. (Original) A brushless vibration motor comprising:

a base plate unit having a burring element extended from the base plate, and including a shaft having a first portion inserted into the burring element to be fixedly coupled to the base plate;

a stator having one or more coils disposed on the base plate through which current flows;

a rotor rotatably supported by a second portion of the shaft, and comprises,

a bearing slidably inserted around the second portion of the shaft,

a bearing holder having an inside surface forcibly coupled to the bearing, and

a yoke coupled to the bearing holder and having a magnet mounted on the yoke to be spaced-apart from the coils to generate a rotation electromagnetic force with the coils, and a counterweight generating eccentricity; and

a cover coupled to the base plate to enclose the stator and the rotor.

2. (Original) The motor of claim 1, wherein the bearing holder forms a space with the bearing forcibly inserted into the bearing holder, and the rotor comprises:

a thrust washer inserted into the space and supported by the second portion of the shaft.

3. (Original) The motor of claim 2, wherein the second end of the shaft comprises:

a distal end formed on the second portion and having a curvature to come into point-contact with the thrust washer to support the thrust washer.

4. (Original) The motor of claim 2, wherein the rotor comprises:

a wall defining the space; and

a hole formed on the wall through which the space communicate with an outside of the bearing holder.

5. (Original) The motor of claim 1, wherein the yoke is formed of a soft magnetic material.

6. (Original) The motor of claim 1, wherein:

the bearing holder comprises,

a cap shape having an opening open to the base plate,

another inside surface forming a space with the bearing, and

a thrust washer inserted into the space and supported by a round end of the second portion of the shaft; and

the yoke comprises,

a first yoke forcibly inserted around an outside surface of the bearing holder, and having the counterweight formed on a portion of the upper yoke, and

a second yoke forcibly inserted around the outside surface of the bearing holder, and having a ring type magnet.

7. (Original) The motor of claim 6, wherein the second yoke is formed of a soft magnetic material.

8. (Original) The motor of claim 1, wherein:

the bearing holder comprises,

a cap shape having an opening open to the base plate,

another inside surface forming a space with the bearing, and

a thrust washer inserted into the space and supported by a round end of the second portion of the shaft; and

the yoke is forcibly inserted around an outside surface of the bearing holder to be fixedly coupled to the bearing holder and comprises,

a first portion limiting a movement of the counterweight with the bearing holder in axial and radial directions of the shaft, and

a second portion mounted with the magnet having a ring type.

9. (Original) The motor of claim 1, wherein:

the bearing holder comprises,

a cap shape having an opening open to the base plate,

another inside surface forming a space with the bearing, and

a thrust washer inserted into the space and supported by a round end of the second portion of the shaft; and

the yoke comprises,

a first yoke forcibly inserted around an outside surface of the bearing holder and formed asymmetrically with respect to the shaft to eccentrically rotate the rotor, and

a second yoke forcibly inserted around the outside surface of the bearing holder and formed with the magnet having a ring type.

10. (Original) The motor of claim 9, wherein the second yoke is formed of a soft magnetic material.

11. (Original) The motor of claim 9, wherein the first yoke is formed of a metal having a specific gravity of less than 10.

12. (Original) The motor of claim 1, wherein the bearing holder comprises a cap shape having an opening open to the base plate, the yoke is coupled to an upper surface of the bearing holder, the magnet is a ring-type disposed on the yoke, and the counterweight is disposed on the yoke.

13. (Original) The motor of claim 12, wherein the yoke forms a space with the bearing holder, and the rotor comprises:

a hole formed on a portion of the bearing holder to communicate with the space and an outside of the bearing holder; and

a thrust washer having one portion inserted into the hole and the other portion disposed in the space between the portion of the bearing holder and the shaft to be supported by a curved end of the second portion of the shaft.

14. (Original) The motor of claim 12, wherein:

the yoke comprises,

a circumference bent toward the base plate;

the magnet comprises,

an inner surface supported by an outer surface of the bearing holder and disposed on the yoke; and

the counterweight comprises,

a protrusion having a step shape in an radial direction of the shaft and disposed between an outer circumferential surface of the magnet and an inside surface of the circumference of the yoke.

15. (Original) The motor of claim 13, wherein the rotor comprises:

an air circulation hole formed on one of the bearing holder and the thrust washer and communicating with a space surrounded by the bearing, the thrust washer, and the shaft.

16. (Original) The motor of claim 1, wherein the motor is a mono phase drive type having a non-motive point, and the rotor comprises:

a cogging torque generating unit disposed on one of the base plate and the cover to prevent the non-motive point.

17. (Original) The motor of claim 16, wherein the magnet comprises a plurality of magnetic poles having a first angle with respect to the shaft, the coil comprises a center line extended

from the shaft, and the cogging torque generating unit is disposed on a line forming a second angle of a quarter of the first angle of one of the coils with respect to the center line of the one coil.

18. (Original) The motor of claim 17, wherein the magnet comprises 6 magnetic poles, the one coil comprises a center line extended from the shaft, and the cogging torque generating unit is disposed on a line having an angle of 15 degrees with respect to the center line of the one coil.

19. (Original) The motor of claim 17, wherein:

the magnet comprises,

6 magnetic poles,

the coils comprise sub-coils each having a center line extended from the shaft; and

the cogging torque generating unit comprises,

sub-cogging torque generating units each disposed on a line having an angle of 15 degrees with respect to corresponding center line of the sub-coils.

20. (Original) A brushless vibration motor comprising:

a base plate unit having a burring element extended from the base plate, and including a shaft having a first portion inserted into the burring element to be fixedly coupled to the base plate;

a stator having at least one coil disposed on a first area of the base plate through which current flows;

a rotor rotatably supported by a second portion of the shaft, and comprises,

a bearing slidably inserted around the second portion of the shaft,

a bearing holder having an inside surface forcibly coupled to the bearing, and

a yoke coupled to the bearing holder and having a magnet mounted on the yoke to be spaced-apart from the coil to generate a rotation electromagnetic force with the coil, and a counterweight generating eccentricity;

a motor drive IC disposed on a second area of the base plate to face the rotor and to control the current flowing through the coil; and

a cover coupled to the base plate to enclose the stator, the rotor, and the motor drive IC.

21. (Original) The motor of claim 20, wherein the stator comprises:

a hall element formed in the motor drive IC in a single body to detect polarity of the magnet.

22. (Original) The motor of claim 20, wherein:

the base plate comprises,

a first side facing the rotor and a second side disposed opposite to the first side; and

the stator comprises,

a printed circuit board disposed on the first side of the base plate and mounted with the coil and the motor drive IC.

23. (Original) The motor of claim 22, wherein the base plate comprises:

a terminal unit formed on one of the first and second sides of the base plate, coupled to the printed circuit board, and coupled to an external source to receive the current.

24. (Original) The motor of claim 22, wherein the stator comprises:

another printed circuit board disposed on one of the first and second sides of the base plate, coupled to an external source to receive the current, and coupled to the printed circuit board having the coil and the motor drive IC.

25. (Original) The motor of claim 20, wherein the base plate comprises:

one of a single printed circuit board and a double-sided printed circuit board.

26. (Original) The motor of claim 20, wherein the bearing holder forms a space with the bearing forcibly inserted into the bearing holder, and the rotor comprises:

a thrust washer inserted into the space and supported by the second portion of the shaft.

27. (Original) The motor of claim 26, wherein the second end of the shaft comprises:

a distal end formed on the second portion and having a curvature to come into point-contact with the thrust washer to support the thrust washer.

28. (Original) The motor of claim 26, wherein the rotor comprises:

a wall defining the space; and

a hole formed on the wall through which the space communicate with an outside of the bearing holder.

29. (Original) The motor of claim 20, wherein the yoke is formed of a soft magnetic material.

30. (Original) The motor of claim 20, wherein:

the bearing holder comprises,

a cap shape having an opening open to the base plate,

another inside surface forming a space with the bearing, and

a thrust washer inserted into the space and supported by a round end of the second portion of the shaft; and

the yoke comprises,

a first yoke forcibly inserted around an outside surface of the bearing holder, and having the counterweight formed on a portion of the upper yoke, and

a second yoke forcibly inserted around the outside surface of the bearing holder, and having a ring type magnet.

31. (Original) The motor of claim 30, wherein the second yoke is formed of a soft magnetic material.

32. (Original) The motor of claim 20, wherein:

the bearing holder comprises,

a cap shape having an opening open to the base plate,

another inside surface forming a space with the bearing, and

a thrust washer inserted into the space and supported by a round end of the second portion of the shaft; and

the yoke is forcibly inserted around an outside surface of the bearing holder to be fixedly coupled to the bearing holder and comprises,

a first portion limiting a movement of the counterweight with the bearing holder in an axial direction and in a radial direction of the shaft, and

a second portion mounted with the magnet having a ring type.

33. (Original) The motor of claim 20, wherein:

the bearing holder comprises,

a cap shape having an opening open to the base plate,

another inside surface forming a space with the bearing, and

a thrust washer inserted into the space and supported by a round end of the second portion of the shaft; and

the yoke comprises,

a first yoke forcibly inserted around an outside surface of the bearing holder and formed asymmetrically with respect to the shaft to eccentrically rotate the rotor, and

a second yoke forcibly inserted around the outside surface of the bearing holder and formed with the magnet having a ring type.

34. (Original) The motor of claim 33, wherein the second yoke is formed of a soft magnetic material.

35. (Original) The motor of claim 33, wherein the first yoke is formed of a metal having a specific gravity of less than 10.

36. (Original) The motor of claim 20, wherein the bearing holder comprises a cap shape having an opening open to the base plate, the yoke is coupled to an upper surface of the bearing holder, the magnet is a ring-type disposed on the yoke, and the counterweight is disposed on the yoke.

37. (Original) The motor of claim 36, wherein the yoke forms a space with the bearing holder, and the rotor comprises:

a hole formed on a portion of the bearing holder to communicate with the space and an outside of the bearing holder; and

a thrust washer having one portion inserted into the hole and the other portion disposed in the space between the portion of the bearing holder and the shaft to be supported by a curved end of the second portion of the shaft.

38. (Original) The motor of claim 36, wherein:

the yoke comprises

a circumference bent toward the base plate;

the magnet comprises,

an inner surface supported by an outer surface of the bearing holder and disposed on the yoke; and

the counterweight comprises,

a protrusion having a step shape in an radial direction of the shaft and disposed between an outer circumferential surface of the magnet and an inside surface of the circumference of the yoke.

39 (Original). The motor of claim 37, wherein the rotor comprises:

an air circulation hole formed on one of the bearing holder and the thrust washer and communicating with a space surrounded by the bearing, the thrust washer, and the shaft.

40. (Original) The motor of claim 20, wherein the motor is a mono phase drive type having a non-motive point, and the rotor comprises:

a cogging torque generating unit disposed on one of the base plate and the cover to prevent the non-motive point.

41. (Original) The motor of claim 40, wherein the magnet comprises a plurality of magnetic poles having a first angle with respect to the shaft, the coil comprises a center line extended from the shaft, and the cogging torque generating unit is disposed on a line forming a second angle of a quarter of the first angle of the coil with respect to the center line of the coil.

42. (Original) The motor of claim 41, wherein the magnet comprises 6 magnetic poles, the coil comprises a center line extended from the shaft, and the cogging torque generating unit is disposed on a line having an angle of 15 degrees with respect to the center line of the coil.

43. (Original) The motor of claim 41, wherein:

the magnet comprises,

6 magnetic poles, the coil comprises sub-coils each having a center line extended from the shaft; and

the cogging torque generating unit comprises,

sub-cogging torque generating units each disposed on a line having an angle of 15 degrees with respect to corresponding center line of the sub-coils.